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10/500,776

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EXAMINER
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CHU, HELEN OK

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1795

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No. 10/500,776	Applicant(s) PRUGH ET AL.	
	Examiner Helen O. Chu	Art Unit 1795	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 October 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12 and 16-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12, 16-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. Applicant's amendment was received on October 16, 2007. Claims 1, 2, 4, 5, 7, 9-12, 16-21. Claims 13-15, 23-26 are cancelled.
2. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action.

### ***Election/Restrictions***

3. Claims 23-26 withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected Group II, there being no allowable generic or linking claims. Election was made **without** traverse in the reply filed on October 16, 2007.

### ***Drawings***

4. The drawing objection is withdrawn because Applicant has amended the drawings.

### ***Specification***

5. The specification objection is withdrawn because Applicant has amended the Specification.

### ***Claim Objections***

6. Claims 2 and 3 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Specifically, claim 1 recites, "a first dimensionally stable temporary substrate adhered to the second surface of the polymer membrane" is narrower than the recitation of claim 2, "a first

dimensionally stable temporary substrate to the second surface of the polymer membrane." Claim 1 states the first dimensionally stable temporary substrate is applied by adhesion, claim 2 states the first dimensionally stable temporary substrate is applied and claim 3 states it is through lamination which can be different from adhesion.

Appropriate corrections are required.

***Claim Rejections - 35 USC § 112***

7. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. Claims 1-12, 16-22 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Specifically, the recitation comprises a two step process of a) and b) in which was never reasonably convey to one skilled in the relevant art. The step of printing/applying a first electrocatalyst coating composition on the first surface of the polymer membrane was disclosed in the specification as a one step process and not a two step process. Appropriate corrections are required.

9. Claims 1-12, 16-22 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed,

had possession of the claimed invention. The recitation "dimensionally stable temporary substrate adhered to the second surface of the polymer membrane" was not disclosed in the specification in such a way as to reasonably convey to one skilled in the relevant art. Particularly, Page 14 states, "the temporary substrate has to adhere to the polymer membrane during the printing step," however, the printing step does not undergo the same step as the adhering step. The Applicants separated these steps into two separates steps as stated in the current amendment.

Furthermore, page 4 states, "a first dimensionally stable temporary substrate, wherein the coating composition is applied to at least portions of the first surface of the polymer membrane." There are not requirements by the specification stating that the first surface of the dimensionally stable temporary substrates to be adhered to the "**second**" surface of the polymer. Appropriate corrections are required.

10. Claims 1-12, 16-22 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The recitation " removing the first dimensionally stable temporary substrate from the second surface of the polymer membrane after the completion of step (d)" is not described in the specification in such as way as to reasonably convey to one skilled in the relevant art. Particularly, there are no limitations in the specification which would convey that step d) has to be completed before step e) occurs. Appropriate corrections are required.

11. Claims 1-12, 16-22 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for "(a) applying at least one electrocatalyst coating composition to an element comprising a polymer membrane having a first and second surface, and a first dimensionally stable temporary substrate, wherein the coating composition is applied to at least portions of the first surface of the polymer membrane", does not reasonably provide enablement for "a first dimensionally stable temporary substrate adhere to the second surface of the polymer membrane . The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use or make the invention commensurate in scope with these claims. The specification does not disclose that a dimensionally stable temporary substrate is required on both sides of the membrane. Appropriate corrections are required.

12. The rejections under 35 U.S.C 112, second paragraph, on claims 1, 5, 7, 10-12 and 16 are withdrawn because Applicants have amended the claims.

13. The rejection under 35 U.S.C 112, second paragraph, on claim 14 is withdrawn because Applicants have amended the claims.

14. The rejection under 35 U.S.C 112, second paragraph, on claim 20 is withdrawn because Applicants have amended the claims.

15. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

16. Claims 1-12,16-22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter

which applicant regards as the invention. Specifically, claim 1 recites, "dimensionally stable temporary substrate". is unclear to the Examiner. A gel form substrate can be temporary dimensionally stable. For instance when a gel from is caste onto a surface, it temporary forms the shape of the mold which can be considered dimensionally stable at that time. Appropriate corrections are required or further explanation is required.

17. Claims 2, 3, 7, 8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, claim 1 recites, "a first dimensionally stable temporary substrate adhered to the second surface of the polymer membrane" is more narrow than the recitation of claim 2, "by applying a first dimensionally stable temporary substrate to the second surface of the polymer membrane." Claim 1 states that the first dimensionally stable temporary substrate is applied by adhesion, claim 2 states the first dimensionally stable temporary substrate is applied and claim 3 states that applying is through lamination which can be different from adhesion. Appropriate corrections are required.

18. Claim 18 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The recitation "wherein the applying step (d), or both is by lamination," is unclear to the Examiner. The term "both" does not apply because there is one of "step (d)." Appropriate corrections are required.

19. Claims depending from claims rejected under 35 U.S.C 112, first paragraph and second paragraph are also rejected for the same.

20. To the extent the claims are understood in view of 35 U.S.C 112 rejections above, note the following prior art rejections.

***Claim Rejections - 35 USC § 103***

21. The rejections under 35 U.S.C 103 (a), on claims 1-8, 10-12, 16-18, and 20-22 being unpatentable over Marsacq et al. are withdrawn because Applicants have amended the claims.

22. The rejections under 35 U.S.C 103 (a), on claims 9 and 14-15 as being unpatentable over Marsacq et al. in view of Lertola are withdrawn because Applicants have amended the claims.

23. The rejections under 35 U.S.C 103 (a), on claims 19 as being unpatentable over Marsacq et al. in view of Sompalli et al. are withdrawn because Applicants have amended the claims.

24. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1,148 USPQ

459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.



This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

25. Claims 1-8, 10-12, 16-18, and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marsacq et al. (WO 01/65623 A1; U.S. Publication Number 2003/0022054 relied upon for English translation) as evidence by Denton et al. (U.S. Patent 5,716,437)

Marsacq et al. teach a method for preparing an electrode-membrane assembly. Marsacq et al. teach that the electrodes are composed of a Teflon coated porous felt, loaded with carbon black, and covered with a finely divided noble metal such as platinum, as a catalyst (paragraph 11). Marsacq et al. teach applying an electrocatalyst coating to an element comprising a polymer membrane having a first and second surface and a first dimensionally stable temporary substrate where in the coating composition is applied to at least portions of the first surface of the polymer membrane (paragraphs 56-58, as applied to claim 1a). The formed electrode is then dried completely (paragraph 59, as applied to claim 1c). The first dimensionally stable temporary substrate is removed from the polymer membrane (paragraph 60, as applied

to claim 1e). Marsacq et al. teach applying an electrocatalyst coating composition to at least a portion of the second surface of the polymer membrane (paragraphs 81-83, as applied to claim 1f). The formed electrode assembly is then dried completely (paragraph 83, as applied to claim 1g). The Marsacq et al. reference discloses that the electrocatalyst is applied by casting, the Marsacq et al. reference does not disclose applications of the electrocatalyst by printing, however, it is known in the art to apply the catalyst onto the electrolyte membrane by known methods such as printing as evidenced by the Denton et al. reference (Column 6, Lines 42-53)

Marsacq et al. teach applying the polymer membrane to a first dimensionally stable temporary substrate (paragraph 56, as applied to claim 2). The substrate can be glass, aluminum, polyester, etc., illustrating that the substrate is dimensionally stable (paragraph 117, as applied to claims 2, 21, and 22).

Marsacq et al. teach that the process of applying the polymer membrane to a first dimensionally stable temporary substrate is done by lamination (paragraph 75, as applied to claim 3 and 18).

Marsacq et al. teach that the electrocatalyst coating comprises an electrocatalyst, an ion exchange polymer, and a liquid medium (paragraph 11, as applied to claims 5-8). Marsacq et al. teach assembling large numbers of these structures (paragraph 16), which is interpreted as repeating the steps of this process to form multiple electrode layers covering the same part of the surface membrane (as applied to claim 10).

Marsacq et al. teach that the electrocatalyst coating composition and drying steps are repeated to form multiple electrode layers (paragraph 16) that vary in

composition and have a non-uniform distribution of the electrocatalyst layer across the electrode layer. Each electrode would contain a slight variation in composition unless a specific process was stated to ensure that each electrode contained the exact composition as the next (as applied to claims 11 and 17). Each electrode would also have a non-uniform distribution because it is impossible to ensure that each electrode contained the same amount of every material combined to make the layer (as applied to claim 12).

Marsacq et al. teach that the electrocatalyst coating composition applied to the opposite surface of the polymer membrane to form the second electrode is in registration with the first electrode on the first surface (example 2, as applied to claim 16).

Marsacq et al. teach that drying is conducted at ambient temperatures (paragraph 73, as applied to claim 20). There is no specific temperature claimed, even though it is stated in the specification. However, Marsacq et al. teach that the temperature range for drying is between 70°C and 150°C, which is close to the range stated in the specification. Therefore, unless unexpected results for the use of a specific temperature are shown, then Marsacq et al. fit the claimed drying temperatures.

Marsacq et al. do not teach applying second dimensionally stable substrate to a first electrode and then removing it. It would have been obvious to one of ordinary skill in the art at the time of the invention to include a temporary substrate on the surface of the first electrode to protect it from being damage while the rest of the membrane electrode assembly (MEA) was being built. This temporary layer is used only for

protection and is eventually removed from the surface after completion of the MEA. By putting this temporary substrate on and then removing it does not show a novelty in the process and due to its lack of criticality (see as how it is removed shortly after application), it is not patentably distinct. 17.

26. ~~Claims 9 and 14-15 are~~<sup>is</sup> rejected under 35 U.S.C. 103(a) as being unpatentable over Marsacq et al. (WO 01/65623 A1; U.S. Publication Number 2003/0022054 relied upon for English translation) as evidence by Denton et al. (U.S. Patent 5,716,437), as applied to claim 1 above, and further in view of Lertola (U.S. Publication Number 2005/0255372 A1).

The disclosure of Marsacq et al. has been discussed above and is incorporated herein. Marsacq et al. do not teach applying the electrocatalyst coating composition is accomplished by flexographic printing and that applying a nonelectrocatalytic coating over at least part of the same area of the substrate which is covered by an electrode layer. Lertola teaches that the electrocatalyst coating can be applied by flexographic printing (paragraph 45, as applied to claim 9).

Lertola teaches that a protective, abrasion resistant, or sealant layer is applied to the electrode layer (paragraphs 52 and 106, as applied to claims 13-~~15~~). It would have been obvious to one of ordinary skill in the art at the time of the invention to apply the electrocatalyst coating through flexographic printing. As evidenced by Lertola flexographic printing is a commonly used technique for applying an electrocatalyst coating. Therefore, it would have been obvious to use this technique to apply the electrodes of Marsacq et al.

It would have been obvious to one of ordinary skill in the art at the time of the invention to include the protective, abrasion resistant, or sealant layer of Lertola on the electrode of Marsacq et al. By including this protective, abrasion resistant, or sealant layer, the electrode can be protected from contamination or deformation before use. 18.

27. Claims 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Marsacq et al. (WO 01/65623 A1; U.S. Publication Number 2003/0022054 relied upon for English translation) as evidence by Denton et al. (U.S. Patent 5,716,437), as applied to claim 1 above, and further in view of Sompalli et al. (U.S. Patent Number 6,524,736 B1).

The disclosure of Marsacq et al. has been discussed above and is incorporated herein.

Marsacq et al. do not teach that the removing in step 1d is by peeling. Sompalli et al. teach peeling the substrate off the membrane (column 8, lines 6-8, as applied to claim 19). It would have been obvious to one of ordinary skill in the art at the time of the invention to remove the substrate of Marsacq et al. using a peeling process like the one in Sompalli et al. Removing the substrate could be done in many ways, therefore it would be an obvious choice to peel the substrate off.

### ***Double Patenting***

28. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-

type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Omum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel* 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321 (c) or 1.321 (d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

29. Claims 1,5-9, 17, and 19-22 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-15 and 18-20 of copending Application No. 10/490,068. Although the conflicting claims are not identical, they are not patentably distinct from each other because the basic concept is the same. In both applications a membrane electrode assembly (MEA) is being made

by a flexographic printing method. In application 10/490,068 the MEA is made in a stack starting with a substrate, then a first electrode, a polymer electrolyte, and finally a second electrode. After the entire MEA is made, then the substrate is removed by peeling. In the current application the MEA is made in a two-step process; a polymer electrolyte is applied to a first substrate and then a first electrode is applied to the polymer electrolyte. Then the first substrate is removed, a second substrate is applied to the first electrode, a second electrode is applied to the other side of the polymer electrolyte, and finally the second substrate is removed. The same product is achieved in both processes with slight modification to the steps used. However, application 10/490,068 is the more cost effective product and would more likely be chosen to be used as a process for making an MEA. The current application does not show a patentably distinct difference from the application 10/490,068, it only adds an added step of applying and then removing a temporary substrate, which is believed to be obvious.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

***Claim Rejections - 35 USC § 103***

30. The rejections under 35 U.S.C 103 (a), on claims 1,5-9, 17, and 19-22 as being unpatentable over O'Brien are maintained. For purposes of convenience the rejection is repeated below.

31.

32. Claims 1,5-9, 17, and 19-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over O'Brien (U.S. Provisional Application 60/349,034 relying upon U.S. Publication Number 2004/0201122 A1 ).

O'Brien teaches a process for manufacturing a catalyst coated membrane wherein the electrocatalyst coating composition comprises an electrocatalyst, an ion exchange polymer, and a liquid medium (claim 14 of the prior art, as applied to claim 5 of the instant application).

O'Brien teaches that the ion exchange polymer is perfluorinated (paragraph 8, as applied to claim 6).

O'Brien teaches that the electrocatalyst coating composition further comprises a fluorinated polymer and that the fluorinated polymer is PTFE fibrils (claims 2 and 3 of the prior art, as applied to claims 7 and 8 of the instant application).

O'Brien teaches that the process for applying the electrocatalyst coating composition to the membrane is accomplished by flexographic printing (paragraph 22, as applied to claim 9).

O'Brien teaches that the electrocatalyst coating composition and drying steps are repeated to form multiple electrode layers covering the same part of the surface (claim 6 of the prior art as applied to claim 10 of the instant application).

O'Brien teaches that the application of the electrocatalyst coating composition and drying steps are repeated to form multiple electrode layers that vary in composition among multiple layers (claim 7 of the prior art, as applied to claim 11 of the instant application).



O'Brien teaches that the application of the electrocatalyst coating composition and drying steps provide an electrode layer with a predetermined non-uniform distribution of electrocatalyst across the electrode (claim 8 of the prior art, as applied to claim 12 of the instant application).

O'Brien teaches applying a non-electrocatalytic coating composition to form a non-electrocatalytic layer over at least part of the same area of the substrate which is covered by an electrode layer (claim 9 of the prior art, as applied to claim 13 of the instant application).

O'Brien teaches that the non-electrocatalytic layer is an abrasion-resistant coating covering the electrode layer (claim 10 of the prior art, as applied to claim 14 of the instant application).

O'Brien teaches that the non-electrocatalytic layer is a sealant covering the electrode layer (claim 11 of the prior art, as applied to claim 15<sup>a</sup> of the instant application).

O'Brien teaches the electrocatalyst coating composition applied onto the opposite surface of the polymer membrane to form the second electrode is in registration with the first electrode (claim 12 of the prior art, as applied to claim 16 of the instant application).

O'Brien teaches that the catalyst coating composition applied to the first surface is different from that applied to the second surface of the polymer membrane (claim 13 of the prior art, as applied to claim 17 of the instant application).

O'Brien teaches that removing the temporary dimensionally stable substrate is done by peeling (paragraph 28, as applied to claim 19).

O'Brien teaches that the drying is conducted at ambient temperatures (claim 18 of the prior art, as applied to claim 20 of the instant application). O'Brien teaches that the temporary supports is selected from the group consisting of polyesters, polyamides, polycarbonates, fluoropolymers, polyacetals, polyolefins, and polyimides (claim 19 of the prior art, as applied to claim 21 of the instant application).

O'Brien teaches that the temporary support is polyester (claim 20 of the prior art, as applied to claim 22 of the instant application). It would have been obvious to one of ordinary skill in the art at the time of the invention to make the process of O'Brien done in more steps including a separate step for adding each electrode to the polymer electrolyte. The same product is achieved in both processes with slight modification to the steps used. However, the process of O'Brien is the more cost effective product and would more likely be chosen to be used as a process for making an MEA. The current application does not show a patentably distinct difference from O'Brien, it only adds an added step of applying and then removing a temporary substrate, which is believed to be obvious.

### ***Response to Arguments***

33. Applicant's arguments filed on October 16, 2007 have been fully considered but they are not persuasive.

Applicants' principal arguments are:

A) The Marsacq patent is directed to electrode membrane assemblies in which the membrane is comprised of a sulphonated polymer with a thermostable skeleton.

The Marsacq patent explains that processes used for adhering electrodes to fluorinated thermoplastic membranes (e.g., Nation@ membranes) are "completely unsuitable" for the disclosed membranes with a thermostable skeleton due to their mechanical stiffness. (See Paragraphs 40, 41 and 46). It is therefore not surprising that the Marsacq patent does not disclose or suggest the process recited in amended claim.

The process of claim 1 makes it possible to directly print electrodes onto opposite side era highly fluorinated proton exchange membrane. This makes it unnecessary to prepare electrodes separately for later transfer to the membrane electrode assembly. With the process recited in claim 1, the polymer membrane is supported on a dimensionally stable substrate when the electrodes are printed on both sides of the membrane. In addition, because the polymer membrane is supported on dimensionally stable support substrates throughout the printing process, the dimensional stability of the membrane is maintained.

B) In the Marsacq patent, the electrodes are prepared in advance and they are applied onto the surface of the still forming membrane while the membrane is wet. It would not be possible to print electrodes onto such still wet surfaces of a polymer membranes. In addition, there is no disclosure in the Marsacq patent of printing electrodes onto opposite sides of a polymer membrane while the dimensional stability of the polymer membrane is at all times maintained by dimensionally stable supports.

C) The '068 application does not claim or disclose a process in which electrodes are printed on both sides of the membrane. The '068 application also does not disclose a

process in which two dimensionally stable support substrates are applied sequentially to a polymer membrane so as to make it possible to print electrodes onto both sides of a polymer membrane while the dimensional stability of the membrane is at all times maintained by the support substrates.

D) The O'Brien application does not disclose a process in which electrodes are printed on both sides of the membrane while the polymer membrane is supported on dimensionally stable support substrates throughout the printing process. Accordingly, claims 1, 5-9, 17 and 19-22 are not rendered obvious by the O'Brien application.

In response the Applicants' arguments, please consider the following:

A) The Examiner believes that the Applicants have mistaken the disclosure of the Marsacq prior art. The Marsacq reference discloses in Paragraph 71 states "it is very surprising that an interface of this quality can be obtained using thermostable polymer; such a result, which until now was only obtained using Nafion type thermoplastic polymers, is achieved for the first time by using the process of the invention." Paragraphs 40, 41 and 46 disclose prior processes which required improvement and as a result, the invention as disclosed by Marsacq was enhanced. The Examiner believes the Applicants have confused the disclosure of the background with the claimed invention as taught by the Marsacq reference.

B) the statement, "it would not be possible to print electrodes onto such still wet surfaces of a polymer membranes," made by the Applicants are merely assertions of which was not supported by evidence. Furthermore, the Marsacq reference does disclose the electrode to be placed on the membrane while maintained by dimensionally

stable supports (Paragraph 60 and 67). As evidence by Denton, printing applications of catalyst or electrodes onto the membrane are well known in the art.

C) this argument is not persuasive, application '068 discloses a membrane electrode assembly (MEA) is being made by a flexographic printing method. In application 10/490,068 the MEA is made in a stack starting with a substrate, then a first electrode, a polymer electrolyte, and finally a second electrode (sequential). After the entire MEA is made, then the substrate is removed by peeling (this indicates the MEA is peeled of some sort of support). In the current application the MEA is made in a two-step process; a polymer electrolyte is applied to a first substrate and then a first electrode is applied to the polymer electrolyte. Then the first substrate is removed, a second substrate is applied to the first electrode, a second electrode is applied to the other side of the polymer electrolyte, and finally the second substrate is removed. The same product is achieved in both processes with slight modification to the steps used. However, application 10/490,068 is the more cost effective product and would more likely be chosen to be used as a process for making an MEA. The current application does not show a patentably distinct difference from the application 10/490,068, it only adds an added step of applying and then removing a temporary substrate, which is believed to be obvious.

D) The Applicants claimed invention does not disclose a process in which electrodes are printed on both sides of the membrane while the polymer membrane is supported on dimensionally stable support substrates throughout the printing process. It seems that the dimensionally stable support only supports one side of the membrane through

step (C) and next, the dimensionally stable is applied on the electrode as indicated by step (D). Thus, the polymer membrane is not supported on a dimensionally stable support substrate throughout the printing process. Furthermore the O'Brien reference indicates that the electrodes are printed on both sides of the membrane while the MEA is supported by a dimensionally stable substrate (Paragraph 12-18). In addition, the only requirement in sequential order as claimed by the Applicants is steps (c) to step (d). There are no requirements for steps (a), (b), (f) and (g) to be in any sequential order.

***Conclusion***

34. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Helen O. Chu whose telephone number is (571) 272-5162. The examiner can normally be reached on Monday-Friday 8am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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TRACY DOVE  
PRIMARY EXAMINER  
12/07